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10/725,640	12/01/2003	Jonathan Alan Shaw	03-2001	4537

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LSI Logic Corporation  
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EXAMINER

NGUYEN, DAO H

ART UNIT

PAPER NUMBER

2818

DATE MAILED: 09/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/725,640

Applicant(s)

SHAW ET AL.

Examiner

Dao H. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 18 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 17-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 November 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. This Office Action is in response to the communications dated 12/01/2003 through 08/18/2005.

Claims 1-24 are active in this application.

### Election/Restriction

2. Application's election with traverse to prosecute the invention of Group I, claims 1-16, drawn to semiconductor devices, filed 08/18/2005, is acknowledged.

The traversal is on the ground(s) that see the election paper. This is not found persuasive because the fields of search for method claims, which is classified in class 438, and device claims, which is classified in class 257, are NOT coextensive and the determinations of patentability of method and device claims are different, that is process limitations and device limitations are given weight differently in determining the patentability of the claimed inventions. Also, the strategies for doing text searching of the device claims and method claims are different. Thus, separate searches are required.

The requirement is still deemed proper and is therefore made **FINAL**.

Claims 17-24 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a non-elected group there being no allowable generic or linking claim.

Applicant has the right to file a divisional application covering the subject matter of the non-elected claims.

3. Applicant is reminded that a complete reply to this Office Action should include cancellation of nonelected claims or other appropriate action (37 CFR 1.144). See MPEP § 821.01. Also, upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a diligently filed petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(h).

### **Specification**

4. The specification has been checked to the extent necessary to determine the presence of possible minor errors. However, the applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### **Claim Rejection - Double Patenting**

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11

F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

6. Claims 1-16 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-9 of U.S. Patent Application 2005/0062586 (patent application serial number 10/668,875). Although the conflicting claims are not identical, they are not patentably distinct from each other because it would have been obvious to one of ordinary skill in the art at the time of the invention was made that the claims of the copending application recite all claimed limitations of the instant application. The claims of the instant application are merely describing the limitations of the copending application in different ways, and they are obviously anticipated by the claims of the copending applications.

For example, the diffusion resistor of the copending application is obviously similar to the polysilicon resistor of the instant application in which the diffusion material is a polysilicon. In addition, the silicon-on-insulator (SOI) substrate of the copending application (claim 4) is obviously the same as the substrate overlain with a (first interlayer) dielectric layer instant application.

### **Claim Rejections - 35 USC § 102**

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claim(s) 1, 3-5, 9, and 11-13 are rejected under 35 U. S. C. § 102 (b) as being anticipated by U.S. Patent No. 4,893,158 to Mihara et al.

Regarding claim 1, Mihara discloses a polysilicon resistor (a polysilicon device wherein its conductivity depends on the resistance of the polysilicon channel), as shown in figs. 3-4, 9-12, and 17, comprising:

a first interlayer dielectric layer 10/6 overlying a substrate 2;

a polysilicon region formed in said interlayer dielectric 10/6;

a first contact region 30 extending down from a surface of said first interlayer dielectric;

a second contact region 32 extending down from said surface of said first interlayer dielectric;

a first contact S connected to said first contact region;

a second contact D connected to said second contact region; and

a third contact G/33 connected to a surface of said polysilicon region, wherein said third contact is located between said first contact and said second contact, wherein said third contact forms a Schottky diode 23 (col. 5, lines 42-56) such that application of a voltage to said third contact forms a depletion region that changes in size depending on a voltage applied to said third contact, thereby changing a resistance in said depletion resistor (the depletion of region 21 depends on the voltage applied to the third contact G/33, and the conductivity or resistivity of the region 21 depends on the size of the depletion region 21; region 21, therefore, functions as a variable resistor in which the amount of current flowing between regions 30/32 through region 21 depends on its depletion; see also col. 6, lines 9-21).

Regarding claim 9, Mihara discloses a chip, as shown in figs. 3-4, 9-12, and 17, comprising:

a substrate 2 on which a plurality of elements of an integrated circuit are formed;

a first interlayer dielectric layer 10/6 overlying said substrate 2;

a polysilicon region formed in said interlayer dielectric;

a first contact region 30 extending down from a surface of said first interlayer dielectric;

a second contact region 32 extending down from said surface of said first interlayer dielectric;

a first contact S connected to said first contact region 30;

a second contact D connected to said second contact region 32; and

a third contact G/33 connected to a surface of said polysilicon region, wherein said third contact is located between said first contact and said second contact, wherein said third contact forms a Schottky diode 23 (col. 5, lines 42-56) such that application of a voltage to said third contact forms a depletion region that changes in size depending on a voltage applied to said third contact, thereby changing a resistance in said depletion resistor (the depletion of region 21 depends on the voltage applied to the third contact G/33, and the conductivity or resistivity of the region 21 depends on the size of the depletion region 21);

wherein said polysilicon region forms a resistor for said integrated circuit (the channel region 21 functions as a variable resistor in which the amount of current flowing between regions 30/32 through region 21 depends on its depletion; see also col. 6, lines 9-21).

Regarding claims 3, and 11, Mihara discloses the polysilicon resistor wherein said polysilicon region is doped with an n-type doping. See figs. 3-4, and 9-12.



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Regarding claims 4, and 12, Mihara discloses the polysilicon resistor wherein said first contact region and said second contact region are n+ contact regions. See figs. 3-4 and 9-12.

Regarding claims 5, and 13, Mihara discloses the polysilicon resistor wherein said first contact, said second contact, and said third contact are formed using metal layers. See col. 5, lines 63-65.

### **Claim Rejections - 35 U.S.C. § 103**

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim(s) 2 and 10 are rejected under 35 U.S.C. 103 (a) as being unpatentable over U.S. Patent No. 4,893,158 to Mihara et al., in view of Brennan et al., U.S. Patent No. 6,455,919.

Regarding claims 2, and 10, Mihara discloses the polysilicon resistor comprising all limitations, except for the third contact being connected to said surface by a salicided region.

Brennan discloses a polysilicon resistor as shown in figs. 16-18, and 21 comprising a third contact 230 between a first and a second contacts 180B, wherein the third contact being connected to a surface of a polysilicon region 205/200 by a salicided region 285.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Mihara so that the third contact would be connected to the surface of the polysilicon region by a salicided region as that of Brennan in order to lower the resistance between the metal of the contact and the silicon portion of the resistor. See col. 5, lines 58-60 of Brennan.

11. Claim(s) 6-8, and 14-16 are rejected under 35 U.S.C. 103 (a) as being unpatentable over U.S. Patent No. 4,893,158 to Mihara et al., in view of the following remarks.

Regarding claims 6 and 14, Mihara discloses the polysilicon resistor comprising all claimed limitations, except for the metals layers being tungsten metal layers.

However, it would have been obvious to one having ordinary skill in the art at the time the invention was made that the metal layer of Mihara could be selected from various common and known materials, such as tungsten, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

Regarding claims 7-8, and 15-16, Mihara discloses the polysilicon resistor comprising all claimed limitations, except for polysilicon region containing n-type dopants having a concentration of about  $1 \times 10^{15} / \text{cm}^3$ , or for the first contact region and the second contact region containing n-type dopants having a concentration of about  $1 \times 10^{18} / \text{cm}^3$  to about  $1 \times 10^{20} / \text{cm}^3$ .

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the dopant concentrations of polysilicon region and the contact regions of Mihara can be at any suitable value or range, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

### **Conclusion**

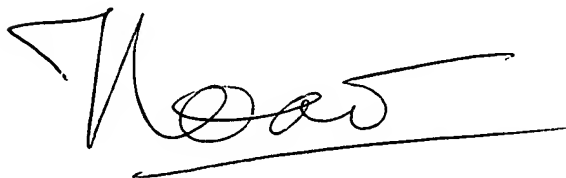
12. A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to become abandoned (see M.P.E.P 710.02(b)).

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dao H. Nguyen whose telephone number is (571)272-1791. The examiner can normally be reached on Monday-Friday, 9:00 AM – 6:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's

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supervisor, David Nelms can be reached on (571)272-1787. The fax numbers for all communication(s) is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-1625.

A handwritten signature in black ink, appearing to read 'Dao H. Nguyen', with a long horizontal line extending from the end of the signature.

Dao H. Nguyen  
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September 16, 2005

A handwritten signature in black ink, appearing to read 'David Nelms', with a circular flourish at the end.

David Nelms  
Supervisory Patent Examiner  
Technology Center 2800